

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Please amend the claims as follows:

1.-68. (canceled).

69. (currently amended) A method of detecting biological moieties comprising:
providing a plurality of compositions capable of characteristic spectral emissions,
the composition comprising a compound and a semiconductor nanocrystal associated
with the compound, wherein each of the members of the plurality is characterized in that:
the nanocrystal of the member of the plurality has an emission spectrum
distinct from the other members of the plurality and a quantum
yield of greater than 10% in water, and
the compound of the member of the plurality has a corresponding
biological moiety distinct from other biological moieties in the
sample;
allowing a sample containing or suspected of containing one or more biological
moieties to interact with the compositions; and
monitoring the spectral emission of each interaction between each composition
and each biological moiety of the sample, wherein the interaction between the biological
moiety and the composition comprises a noncovalent interaction.

70. (original) The method of claim 69, wherein the compound comprises a
molecular complex with a molecule associated with the nanocrystal complexed to a
second molecule that interacts with the biological moiety.

71. (original) The method of claim 69, wherein each interaction between each composition and each biological moiety of the sample are monitored substantially simultaneously.

72. (original) The method of claim 69, wherein the spectral emission provides information about a biological state or event.

73. (original) The method of claim 72, wherein the spectral emission provides information about the amount of biological moiety in the sample.

74. (original) The method of claim 72, wherein the spectral emission provides information about the presence of the biological moiety in the sample.

75. (original) The method of claim 69, wherein the semiconductor nanocrystal is water-soluble.

76. (original) The method of claim 69, wherein the semiconductor nanocrystal comprises a core comprising a semiconductor material, and a layer overcoating the core comprising a semiconductor material.

77. (original) The method of claim 69, wherein the spectral emission is tunable to a desired wavelength by controlling the size of the nanocrystal.

78.-95. (canceled)

96. (previously presented) The method of claim 69, wherein monitoring the spectral emission occurs in assays selected from the group consisting of: immunochemistry, immunocytochemistry, immunobiology, immunofluorescence, DNA sequence analysis, fluorescence resonance energy transfer, flow cytometry, fluorescence activated cell sorting, diagnostics in biological systems, and high-throughput screening.

97-98. (canceled)

99. (currently amended) The method of claim 69 98, wherein the noncovalent interaction comprises hydrophobic interaction, hydrophilic interaction, electrostatic interaction, van der Waals interaction, or magnetic interaction.

100. (previously presented) The method of claim 69, wherein the biological moiety comprises a small molecule.

101. (previously presented) The method of claim 69, wherein the biological moiety comprises a protein, peptide or antibody.

102. (previously presented) The method of claim 69, wherein the biological moiety comprises a nucleic acid.

103. (previously presented) The method of claim 102, wherein the nucleic acid comprises DNA or RNA.

104. (previously presented) The method of claim 69, wherein the biological moiety comprises an amino acid.

105. (previously presented) The method of claim 69, wherein the biological moiety comprises a ligand.

106. (previously presented) The method of claim 69, wherein the biological moiety comprises an antigen.

107. (previously presented) The method of claim 69, wherein the biological moiety comprises a cell.

108. (previously presented) The method of claim 69, wherein the biological moiety comprises a subcellular organelle.

109. (currently amended) A method of detecting biological moieties comprising:
providing a plurality of compositions capable of characteristic spectral emissions, the composition comprising a compound and a semiconductor nanocrystal associated with the compound, wherein each of the members of the plurality is characterized in that:
the nanocrystal of the member of the plurality has an emission spectrum distinct from the other members of the plurality, and
the compound of the member of the plurality has a corresponding biological moiety distinct from other biological moieties in the sample and is associated with the nanocrystal by a ligand having at least one linking group for attachment to the nanocrystal spaced apart from a hydrophilic group by an alkyl or alkenyl group;
allowing a sample containing or suspected of containing one or more biological moieties to interact with the compositions; and
monitoring the spectral emission of each interaction between each composition and each biological moiety of the sample, wherein the interaction between the biological moiety and the composition comprises a noncovalent interaction.

110. (previously presented) The method of claim 109, wherein the hydrophilic group is selected from the group consisting of carboxylic acid, carboxylate, sulfonate, hydroxide, alkoxide, ammonium, phosphate, and phosphonate.

111. (previously presented) The method of claim 109, wherein each interaction between each composition and each biological moiety of the sample are monitored substantially simultaneously.

112. (previously presented) The method of claim 109, wherein the spectral emission provides information about a biological state or event.

113. (previously presented) The method of claim 109, wherein the semiconductor nanocrystal is water-soluble.

114. (previously presented) The method of claim 109, wherein the semiconductor nanocrystal comprises a core comprising a semiconductor material, and a layer overcoating the core comprising a semiconductor material.

115-117. (canceled)

118. (previously presented) The method of claim 109, wherein the biological moiety comprises a small molecule.

119. (previously presented) The method of claim 109, wherein the biological moiety comprises a protein, peptide or antibody.

120. (previously presented) The method of claim 109, wherein the biological moiety comprises a nucleic acid.

121. (previously presented) The method of claim 120, wherein the nucleic acid comprises DNA or RNA.

122. (previously presented) The method of claim 109, wherein the biological moiety comprises an amino acid.

123. (previously presented) The method of claim 109, wherein the biological moiety comprises a ligand.

124. (previously presented) The method of claim 109, wherein the biological moiety comprises an antigen.

125. (previously presented) The method of claim 109, wherein the biological moiety comprises a cell.

126. (previously presented) The method of claim 109, wherein the biological moiety comprises a subcellular organelle.

127. (previously presented) The method of claim 109, wherein the spectral emission is tunable to a desired wavelength by controlling the size of the nanocrystal.

128. (previously presented) The method of claim 109, wherein monitoring the spectral emission occurs in assays selected from the group consisting of: immunochemistry, immunocytochemistry, immunobiology, immunofluorescence, DNA sequence analysis, fluorescence resonance energy transfer, flow cytometry, fluorescence activated cell sorting, diagnostics in biological systems, and high throughput screening.

129. (previously presented) The method of claim 109, wherein the spectral emission is tunable to a desired wavelength by controlling the size of the nanocrystal.

130. (previously presented) The method of claim 109, wherein monitoring the spectral emission occurs in assays selected from the group consisting of: immunochemistry, immunocytochemistry, immunobiology, immunofluorescence, DNA sequence analysis, fluorescence resonance energy transfer, flow cytometry, fluorescence activated cell sorting, diagnostics in biological systems, and high throughput screening.

131-132. (canceled)

Applicant : Mouni G. Bawendi et al.
Serial No. : 09/832,959
Filed : April 12, 2001
Page : 8

Attorney's Docket No.: 14952.0273 D1 / MIT Case 7772 DIV

133. (currently amended) The method of claim 109 ~~130~~, wherein the noncovalent interaction comprises hydrophobic interaction, hydrophilic interaction, electrostatic interaction, van der Waals interaction, or magnetic interaction.